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ABSTRACT

Instructional materials designed to teach teachers some fundamental skills needed to implement objectives-based instruction are described, as well as the procedures and results of the initial tryout of the materials at Arizona State University with more than 400 preservice and inservice teachers. Participants used self-instructional booklets, supplemental practice exercises, and teaching skills tests for units on writing objectives, designing instruction, and assessing learning for competency-based programs. A course evaluation questionnaire was used to assess the teachers' attitudes towards these materials, and 78 to 89 percent of the respondents agreed that the course content was relevant, well taught, and that they had profited from the experience. (MER)

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TEACHING TEACHERS SKILLS NEEDED TO IMPLEMENT OBJECTIVES-BASED INSTRUCTION

Division of Instructional Development
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April 1981

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Individuals involved in the systematic development of instruction have frequently noted that classroom teachers lack teaching skills needed to select and implement objectives-based instructional programs (Scanlon & Mosley, 1968; Deep, 1971; Niedermeyer, Kalins & Oliver, 1972; Higgins, 1980). Recent state and federal legislation requiring the implementation of minimal competency testing programs in schools (Pipho, 1978) and the development of individual education plans for handicapped children (Public Law 91-142) has increased the need for teachers to acquire skills needed to implement objectives-based instruction in school settings.

The need for instruction in teaching skills required to implement objectives-based instruction may not be obvious to many teacher educators. Most teacher education programs include instruction on topics such as instructional objectives, teaching methods, and tests and measurement. These topics are frequently taught in separate courses without showing their relationships to one another and without requiring teachers to demonstrate the application of the topics in everyday teaching situations. When instruction is not carefully coordinated, the interrelationships between instructional objectives, instructional activities, and student assessment are not readily apparent to teachers and are not likely to be learned and used.

The instructional materials described in this paper were developed to teach teachers some fundamental skills needed to implement objectives-based instruction. The materials were designed to be used in both preservice and inservice teacher education programs. Systematic instructional development procedures were used to produce instructional materials that (1) effectively teach selected skills required to implement objectives-based instructional programs, (2) develop positive teacher attitudes toward the skills taught and toward the methods used to teach those skills, and (3) produce consistent teacher performances and attitudes when used in different instructional settings by different instructors.

The development process consisted of defining the teaching skills to be taught, developing materials for teaching and assessing those teaching skills, and revising the materials based upon data obtained through a series of tryout-revision cycles over a three year period (six semesters). The derivation of the teaching skills and the design of the instructional materials are described by Sullivan and Higgins (Note 1). The design of the assessment materials used to assess teachers' attainment of the teaching skills is described by Krus and Maher (Note 2). This report includes a description of the tryout procedures used to verify the effectiveness of the instructional materials and the results obtained.

Materials

The set of basic teaching skills formulated for the program was derived from an analysis of the tasks needed to implement objectives-based instruction in a wide range of subject areas and grade levels. The skills are organized into three instructional units: Writing Worthwhile Objectives, Designing Effective Instruction, and Assessing Student Learning. The thirteen teaching skills are listed in Figure 1.

Figure 1

Teaching Skills Taught in the Program

Writing Worthwhile Objectives

1. Distinguishing Instructional Objectives from Instructional Activities.
2. Identifying Worthwhile Objectives.
3. Identifying Well-Written Objectives.
4. Writing Objectives.

Designing Effective Instruction

5. Identifying Appropriate Instructional Information.
6. Writing Instructional Information.
7. Identifying Appropriate Practice Activities.
8. Describing Appropriate Practice Activities.
9. Identifying Effective Practice Activities.
10. Identifying Effective Feedback Procedures.

Assessing Student Learning

11. Identifying Appropriate Assessment Items.
12. Identifying Well Written Assessment Items.
13. Writing Assessment Items.

A complete set of materials was developed for use in teaching and assessing the skills listed above. The materials (Note 3) are briefly described below.

Self-instructional booklets. Three self-instructional booklets were developed, one for each unit of instruction. Each booklet includes information needed to perform the teaching skills included in the unit, practice items related to each skill, and feedback in the form of knowledge of correct answers to practice items.

- Supplemental Practice Exercises. Supplemental practice exercises were prepared for each of the thirteen teaching skills. Each exercise included from 5 to 10 items designed to ensure mastery and retention of the skills and to provide for generalization of the skills across a wide range of subject areas and grade levels.

- Teaching Skills Tests. Teaching skills tests were developed to assess attainment of the skills taught in each of the three booklets. Each test includes from 5 to 20 items for assessing each skill. The assessment items in the skills tests are parallel forms of the practice items in the self-instructional booklets and in the supplemental practice exercises.

Tryout Procedures

The instruction and assessment materials described above were the products of a succession of formative tryouts that extended over a three year period. Ten instructors and more than 400 preservice and inservice teachers participated in the tryout and revision of the materials.

The tryout of the materials reported in this paper was conducted at Arizona State University during the Fall Semester 1980. Seventy-eight (78) third and fourth year undergraduate preservice teachers participated in the tryout. The teachers were enrolled in five sections of a general teaching methods course required in elementary and special teacher education programs. Each section of the course was taught by a different instructor. The instructors included one full-time professor of education and four part-time faculty associates. All of the instructors had masters or equivalent degrees in educational technology and from 1 to 6 semesters experience in using the materials.

The course sections in which the materials were used varied with respect to scheduled meeting times, meeting locations, and number of teachers enrolled. Two sections met one day (three hours) per week; two sections met two days (1.5 hours each day) per week; and one section met three days (1 hour each day) per week. Four of the sections met on the main campus of the University; one section met in an elementary school 25 miles from the main campus. Each section enrolled from 10 to 25 preservice teachers with a mean enrollment of 15.6 teachers per section.

Instruction and assessment was conducted over a five to six week period at the beginning of the semester. Prior to initiating any instruction the students within each section were randomly assigned to complete one of the three teaching skills tests. One-third of the teachers in each section completed the Writing Worthwhile Objectives test; one-third completed the Designing Effective Instruction test; and one-third completed the Assessing Student Learning test. Previous tryouts indicated that exposure to the teaching skills test prior to instruction does not effect posttest performance on the tests.

Following the administration of the teaching skills tests (pretesting), the teachers were instructed on each of the teaching skills. Portions of the self-instructional booklets were assigned to be read outside of the regularly scheduled class meetings. Supplemental practice exercises related to the reading assignments were also assigned to be completed outside of class. Class meetings were used to clarify questions the teachers had concerning the assigned reading, to ensure that the teachers completed the supplemental practice exercises, and to provide feedback (confirmation of correct answers) for the supplemental practice. The materials were used in the sequence outlined in Figure 1 by four of the five instructors. One instructor altered the order and taught Assessing Student Learning before Designing Effective Instruction.

Upon completion of each self-instructional booklet and related practice exercises all of the teachers were administered the related teaching skills test (posttest). A questionnaire designed to assess the teachers' opinions about the relevance of the teaching skills and the quality of instruction was administered at the conclusion of the tryout.

Tryout Results

The mean percentage scores obtained during the final tryout are reported in Table 1. Pretest and Posttest scores are reported for each of the thirteen skills taught. It can be seen that the pretest scores ranged from a low of 36 (Writing Objectives) to a high of 75 (Distinguishing Objectives from Activities). Posttest scores ranged from a low of 82 (Identifying Well Written Objectives) to a high of 94 (Identifying Appropriate Practice and Identifying Effective Practice). Teachers' pretest scores were higher on those skills that required selected responses, i.e., identifying, than on those skills that required constructed responses, i.e., writing. Pretest scores on skills requiring selected responses ranged from 46 to 75 while scores on skills requiring constructed responses ranged from 36 to 53. The differences in posttest scores for selected response skills (82-94) and constructed response skills (87-89) was not as great. The teachers showed pretest to posttest gains on all the skills. Gains ranged from 15 (Distinguishing Objectives from Activities) to 52 (Writing Objectives) percent with a mean percentage gain of 32.4 over all skills.

The distribution of pretest-posttest percentage scores for the three teaching skills tests are presented in Figure 2. The mean scores increased from pretest to posttest for each test. The variance and standard deviation decreased for each test. The lowest score on the posttest equaled or exceeded the mean pretest score on each of the skills test. All teachers made gains in the scores from pretest to posttest.

Table 1

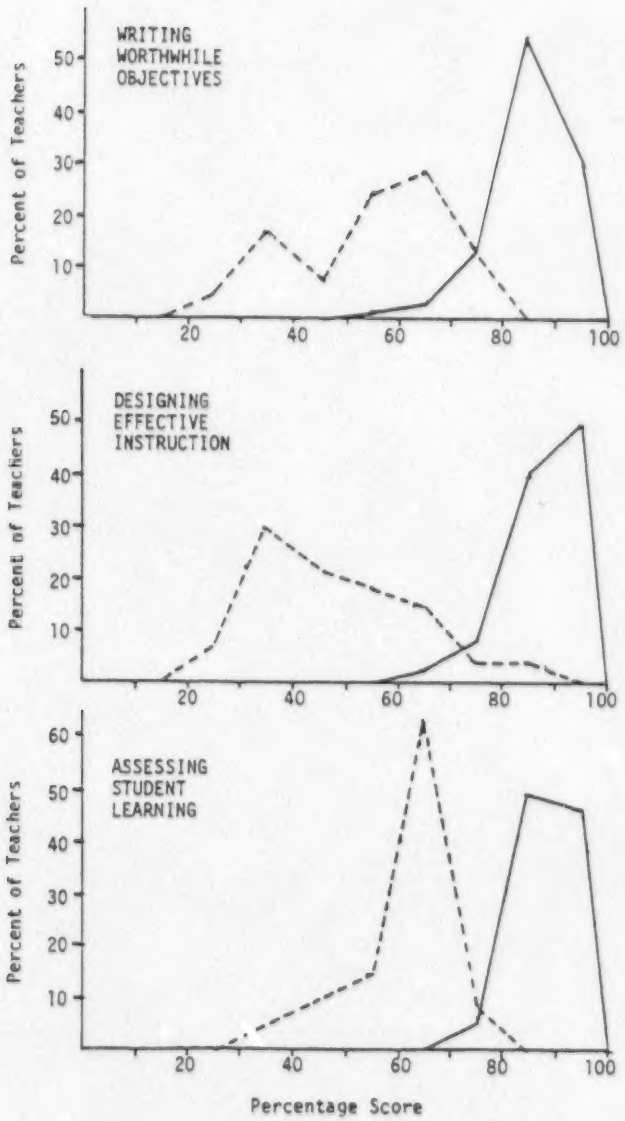
MEAN PERCENTAGE SCORES BY SKILL

Writing Worthwhile Objectives	Pre	Post
Distinguishing Objectives from Activities	75	90
Identifying Worthwhile Objectives	65	91
Identifying Well-Written Objectives	61	82
Writing Objectives	36	88
Designing Effective Instruction		
Identifying Information	68	92
Writing Information	46	85
Identifying Appropriate Practice	46	94
Describing Appropriate Practice	43	89
Identifying Effective Practice	54	94
Identifying Feedback Procedures	46	92
Assessing Student Learning		
Identifying Appropriate Items	71	90
Identifying Well Written Items	64	89
Writing Assessment Items	53	87

Figure 2

Pretest Posttest Percentage Score Distributions

- - - Pretest —— Posttest



Percentage scores on each test for each of the five instructor/sections are reported in Table 2. Analysis of variance of posttest scores indicated that there were no statistically significant differences between the five instructor/sections on the Writing Worthwhile Objectives test and on the Designing Effective Instruction test. A statistically significant difference ($p = .02$) between instructor/sections was indicated for the Assessing Student Learning test. A Student-Newman-Kuels (SPSS) post hoc analysis indicated a significant difference ($p = .05$) between section B (mean 83) and section D (mean 91) for the Assessing Student Learning test . Thus, only 1 of the 30 instructor/section comparisons was statistically significant.

Table 2

Mean Posttest Percentage Scores by Instructor/Section

Instructor/Section	Writing Objectives	Designing Instruction	Assessing Learning
A.	87	88	88
B.	86	8[illegible]	83*
C.	85	86	87
D.	89	89	91*
E.	89	85	90

*Significant differences between these two groups ($p = .05$).

The teachers' attitudes toward the instruction were elicited on a course evaluation questionnaire. The percent of teacher responses (agree, neutral, or disagree) to four evaluation items is reported in Table 3. A strong majority (78-89 percent) of the teachers agreed that the course content was relevant, that the course was well taught, and that they learned a lot in the course.

Table 3

Percent of Responses to Course Evaluation Items

Evaluation Item	Agree	Neutral	Disagree
1. The course content was relevant	87	11	2
2. The course was well taught	89	5	6
3. Overall, this was a good course	82	12	6
4. I learned a lot in this course	78	14	8

Summary

The purpose of the development project described in this paper was to develop instructional materials that would effectively teach teachers basic skills needed to implement objectives-based instruction in a wide range of school subjects and grade levels. Additional purposes of the project were to develop materials that were appealing to the teachers who used them and that would produce consistent results when used by different instructors in different instructional situations. Teachers attained average posttest percentage scores of 88 to 91 on each of the three teaching skills tests. Teacher performance on the posttest was highly consistent, across the five instructor sections that participated in the tryout. The teachers who participated in the tryout had highly favorable attitudes toward the instructional materials and procedures used.

Reference Notes

1. Sullivan, H., & Higgins, N. Designing instruction to teach skills needed to implement objectives-based instruction. Paper presented at the meeting of the Association for Educational Communications and Technology, Philadelphia, April 1981.

2. Krus, P., & Maher, J. Assessing teacher skills needed to implement objectives-based instruction. Paper presented at the annual meeting of the Association for Educational Communication and Technology, Philadelphia, April 1981.

3. The complete set of materials used in the tryout is available from Teaching for Competence, P.O. Box 27553, Tempe, Arizona 85282.

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